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ABSTRACT

The Positive Attitudes in Tennessee Schools Project (PATS), a collaborative school-improvement effort, was implemented in Tennessee schools in 1989. The project is based on the premise that a cultural transformation in the schools is needed to provide more supportive learning environments. This paper presents findings of a longitudinal study that sought to determine the extent of changes in the participating schools' cultural environments. In spring 1993, a total of 92 schools (51 elementary, 21 middle, and 20 high schools) participated in a school climate audit, which measured seven school climate factors through the Tennessee School Climate Inventory. A multivariate analysis of covariance (MANCOVA) was conducted to assess the impact of the program on the seven dependent variables (school climate factors). Findings indicate that overall, school climate dimensions remained relatively stable over time. However, the program has had the greatest effect on transforming instructional values and practices at the elementary level. Results point to the resiliency of school climates to change. Some research suggests that the impacts of educational reform take 3 to 5 years to materialize. Three tables are included. (LMI)

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Improving Learning Environments Through
A State-wide Collaboration

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Presented in this paper is a study conducted as a part of a multi-wave, longitudinal analysis of learning environments initiated in Tennessee in 1989. The investigation is part of a research agenda developed in association with a school improvement effort known as PATS, Positive Attitudes in Tennessee Schools Project (Pike and Chandler, 1989). Within this project, school leadership teams, state department of education personnel, and university researchers have collaborated to accomplish several goals over a five-year period. A major goal is to improve school learning environments as cultural systems by means of various strategies, including the development and use of a system of empirical indicators which provide an information base for use in data-based decision making and planning. Data sets obtained through the indicator system developed for the project are utilized in the analyses reported here.

Conceptual Framework for the School Improvement Project

The focus of PATS is on improvement of the school as a unit. From a policy-making perspective, the school as a unit of change has become politically important in recent years (Heck & Mayor, 1993). Reform efforts such as restructuring, school choice, school-based decision making, use of standards and accountability, culture building, along with efforts to study the characteristics of exemplary schools, are grounded on the belief that schools as organizational units can be altered and evaluated in terms of their characteristics and productivity. Development of systems for profiling school contextual indicators is an outgrowth of this policy perspective (Oakes, 1986, 1989). The development of strategies for generating contextual indicators as organizational attributes have been advocated by many reformers and researchers (Heck & Mayor, 1993; Porter, 1991; Rumberger & Willms, 1992).

Accompanying the call for the development of educational indicators is use of data-based, or informed, decision making and planning as a strategy for improving the performance of America's public schools (Ross & Mahlick, 1990; Wilson, Miller, & Roams, 1985). The indicator system developed for PATS is grounded on the belief that school contextual information could be used by school personnel to address issues and problems associated with learning environments (Butler & Alberg, 1993; David, 1987; Ross & Malck, 1990).

One of the first steps involved in developing this system of collecting and reporting school context indicators was a conceptual formulation of what is meant by a school's learning environment. In PATS, a learning environment is viewed as a composite of school and classroom sociopsychological factors which influence student achievement, attitudes, motivations, and conceptions of self (Stockard & Mayberry, 1985). Data utilized as indicators of school and class contexts were obtained by a set of measures yielded by instruments comprising the *Learning Environment Assessment System* (Butler & Alberg, 1990a). Data are collected as perceptual information from school professional personnel and students. Professional personnel provide

information through which overall school climate or culture dimensions are constructed. Students provide their perceptions of class contexts and their self-concepts as learners. Three different inventories are used to generate the measures. In this report, only data obtained from professional personnel are presented.

Numerous organizational, social, cultural, personal, and physical factors influence school contexts (Anderson, 1982; Deal, 1993; Heck & Mayor, 1993; Purkey & Smith, 1983, Sashkin & Walberg, 1993), though many valued characteristics are often beyond current measurement technology (Oakes, 1989). The system of indicators used to generate data included in this report focuses primarily on cultural aspects of schools: perceptual patterns relative to those beliefs, values, relationships, and expectations believed to affect the quality of teaching and learning.

The change model utilized in PATS acknowledges that organizational and environmental changes require modifications of school cultures that support or inhibit change. Thus, information collection and reporting strategies were designed to obtain perceptions of cultural aspects of the schools at selected times and to profile changes reflected over an extended period. As Maehr and Buck (1993) have noted: "If you can begin to assess school culture-or significant facets of it- in a standardized fashion, then it is possible for any given school to assess its character, evaluate it, and then begin to consider change " (p. 45). They propose that school reform necessitates the transformation of school culture, with the crucial issue being "...how teachers and students think about, believe in, and value learning-and going about their business of teaching and learning and relating to one another" (p. 41)

People know experientially that schools reflect variations in their climates and that these differences affect how people behave (Miskel & Ogawa, 1988). "Different schools do things differently. They march to different drummers, hold different things sacred, walk and talk in varying manners (Maehr and Buck, 1993, p. 43). The climate of an organization has been defined by Tagiuri (1968) as a relatively enduring quality of the internal environment of an organization that is experienced by its members, influences their behaviors, and can be described in terms of the characteristics of the organization. Dimensions of organizational climate, Tagiuri proposed, include its ecology (physical and material aspects), its milieu (presence of persons and groups), its social system (patterned relationships of persons and groups), and its culture (belief systems, values, cognitive structure, and meaning). Halpin and Croft (1963), who developed one of the first measures of organizational climate, posited that school climate could be conceptualized as the quality of faculty-principal relations grounded on the leadership model reflected by the administration.

The theory and research tradition initiated by Halpin and Croft remains a dominant perspective in contemporary conceptions of educational leadership and school change. Schein (1985) has suggested that "there is a possibility...that the *only thing of real importance that leaders do is to create*

and manage culture and that the unique talent of leaders is their ability to work with culture" (p. 2). He has proposed various mechanisms by which leaders monitor and establish cultures and how actions of leaders influence how organizational members interpret events and assign meaning within the work setting. Numerous contemporary scholars (Bowman & Deal, 1992; Lane and Epps, 1992; Deal, 1993; Deal and Peterson, 1990; Firestone & Wilson, 1993; Krug, 1993; Sashkin, 1993; Sashkin and Sashkin, 1993; Sashkin & Walberg, 1993) are pursuing research agendas focusing on leadership and changes in schools as organizational cultures. Concepts of "cultural leadership" and "transformational leadership" permeate the scholarly literature on school change.

In summary, the fundamental premise of PATS is that a cultural transformation was needed if Tennessee schools were to provide more supportive learning environments. This project presented an opportunity to plan and implement a comprehensive support system to assist leaders interested in transforming school cultures. Thus, the school-university-state department collaboration was created in 1989 and remains active today. Some outcomes of that collaboration are addressed in this report.

Background for the Present Study

PATS was initiated in the summer of 1989 when the first training academy was held for leadership teams representing 41 schools selected as Pilot sites. Initial learning environment audits were conducted in the fall semester of 1989. Subsequent audits were conducted in the Pilot sites in the spring semesters of 1990-1993. Additional schools became involved in the project in 1990, 1991, and 1992. Overall, 169 schools have participated, representing more than 11,000 faculty and staff respondents.

An analysis of the first data wave in the Fall of 1989 identified dominant organizational climate factors existing in the pilot sites at that point in time (Butler, 1990). Generalizations were derived from aggregated state-wide data using grade-level configuration (elementary, middle, and senior highs) as the unit of analysis. The report concluded with the following:

Whether the realities of school learning environments measured during the fall of 1989 will be similar at later points in time is unknown. Data generated in the Spring of 1990, and in subsequent years, will be utilized in answering questions relative to changes and stability in patterns over time. School improvement plans being developed and implemented to produce changes in learning environments may indeed yield outcomes which differ from those observed in the baseline data. The organizational and behavioral patterns reflected in these data, however, many have consistency and stability difficult to modify (Butler, 1990, p. x).

The Current Study

The present study was developed to (a) determine if school climate dimensions remained stable over time, (b) assess the impact of participation in the collaboration, and (c) analyze the influence grade-level structure might have on changes observed. An additional goal was to determine if the most recent school climate variables would discriminate between the schools based upon time of participation (experienced and beginner schools) in the project.

Method

School Sample

The 92 schools providing data for this study completed the designated baseline audit for a specific cohort and also participated in the school climate audit during the Spring of 1993. Characteristics of these schools are presented in Table 1. The 51 elementary schools represented

Insert Table 1 About Here

55.4% of the total sample. The 21 middle and 20 senior high schools comprised 22.8% and 21.7%, respectively. School were located throughout the state though a higher proportion were located in the eastern part. More than two-thirds of the schools served rural or small town communities; about one-third were urban or suburban. Size of teaching faculties ranged from 8 to 80, with senior high schools typically having larger faculties. More than 6,000 professionals provided data analyzed here.

Instrumentation

School climate data were obtained through use of *The Tennessee School Climate Inventory (TSCI)*; Butler & Alberg, 1991). Items of the inventory comprise seven scales, or dimensions, associated with effective schools and organizational climates (Anderson, 1982; Purkey & Smith, 1983; Walberg, 1987). The seven factors are: Order, Leadership, Environment, Involvement, Instruction, Expectations, and Collaboration. The inventory consists of 49 items (seven per dimension) which are rated using a five-point scale (1=strong agreement, 5=strong disagreement). The range of scores is 7-35, with higher scores associated with more positive learning environments.

The concept of school climate used to develop the *TSCI* encompassed "norms, beliefs, and attitudes reflected in institutional patterns and practices that enhance or impede student achievement" (Wallich, 1981). The notion of climate is similar to that of "culture" which includes belief systems, values, general cognitive structures, and meanings that govern patterned relationships of persons and groups (Tagiuri, 1968).

Internal consistency alpha coefficient estimates for the *TSCI* are .96 at the elementary school level, .97 at the middle school level, and .93 at the senior high school level; alpha coefficients for the seven school climate scales range from .76 to .96 (Butler & Alberg, 1990b). Test-retest reliability estimates for the dimensions after a seven-month interval range from .66 to .85 (Kenney, 1993a).

Analysis

A 2X2 multivariate analysis of covariance (MANCOVA) design was employed using the seven *TSCI* dimensions as dependent variables to determine changes and assess the influences of time of program participation and grade-level configuration. Discriminant function analysis was used to determine the predictive capability of *TSCI* dimensions in differentiating experienced from beginner schools.

Schools were categorized as experienced if they had participated in at least four school climate audits. That is, they had participated in a baseline and at least three subsequent audits (three or more years of program activity). Beginner schools participated in two audits during one year of actual program activity. To obtain relatively equal numbers of schools in each cell of the 2X2 design, middle and senior high schools were grouped together and compared with elementary schools. Such an approach was statistically sound since elementary schools have been found to differ significantly from middle and senior high schools on *TSCI* dimensions (Kenney, 1993b).

TSCI scores used were T-scores (mean = 50, standard deviation = 10) standardized on results obtained from 129 elementary, middle, and senior high schools, representing more than 4,300 respondents (Kenney, 1993b).

Results

The first objective of the inquiry was to assess the effects of experience in the project and school grade-level configuration on seven climate dimensions. The statistical analysis revealed a main effect for grade-level configuration, Wilks $\Lambda = .75$, $F_{(7,75)} = 3.59$, $p < .01$, which involved the climate dimension of instruction, $F_{(1,81)} = 5.25$, $p < .05$. Elementary schools were associated with statistically significant changes in perceptions of instructional quality, as compared with middle and senior high schools. The main effect for experience in the project was not statistically significant, Wilks $\Lambda = .88$, $F_{(7,75)} = 1.50$, $p > .05$, and no significant interaction between experience and grade-level configuration was present, Wilks $\Lambda = .93$, $F_{(7,75)} = .77$, $p > .05$. As reported in Table 2, experienced schools did have higher mean scores than beginner schools on all dimensions.

Insert Table 2 About Here

A second objective was to determine if the 1993 school climate dimensions discriminated between the schools on the basis of time (experienced and beginner schools). Direct-entry discriminant analysis was used to accomplish this objective. The canonical correlation between the five dimensions selected in the analysis (Order, Leadership, Environment, Involvement, and Instruction) and experience level (0 = beginner, 1 = experienced) was .23. As a combination, these variables significantly discriminated experienced from beginner schools, Wilks $\Lambda = .82$, $\chi^2 = 12.64$, $p < .05$). The derived discriminant function correctly classified 69.6% of the schools.

Discussion

This research sought to assess the stability of seven climate factors in Tennessee schools participating in a collaboration designed to improve learning environments. As applied research, the inquiry sought to evaluate a project stressing periodic climate data collection and reporting to support data-based decision making addressing cultural transformation issues in public schools. Results validate that school climate dimensions analyzed here remained relatively stable over time though ratings of instruction in elementary schools changed statistically. This evidence suggests that the major impact of the collaboration, using an analysis which aggregated schools by grade-level configuration, has been on transforming values and practices associated with instruction in elementary school sites. This finding is encouraging since various staff development activities introduced in the leadership academies and schools sites over the four-year period focused on valuing teaching and learning styles and instructional strategies that addressed diversity of student learning modes. The lack of statistically significant changes in the other climate indicators, especially in schools serving older students, while disappointing, is not unexpected. Results here confirm the theoretical proposition that school cultures tend to remain stable over time, even when concerted efforts are made to transform them. Also, given the analytical strategy used, aggregating data from a large sample of schools by grade-level patterns and time in program participation, the findings are not surprising.

Several explanations may be proposed in light of these results. First, it may be concluded that PATS has had little effect on transforming school learning environments. On the surface, this conclusion seems reasonable since climate factors, with the exception of instruction in elementary sites, did not significantly vary over time. Examination of the changes observed, however, indicates that, with the exception of order in the case of beginner schools, all other dimensions showed net improvement over time, even among beginner schools. The canonical correlation between school climate dimensions and experience suggest that 70% of the schools would be expected to improve school climate variables over a three- to four-year period; 30% would be expected to improve in one year of participation. Thus, some evidence for the positive impact of the project on school climate dimensions is provided.

A second explanation relates to the climate indicators used as well as the resiliency of school climates or cultures in Tennessee schools. Climate measures used here have moderate to high test-retest reliability (Kenney, 1993a). Moreover, it is obvious that considerable stability is reflected in the indicators analyzed here. However, schools with more than one year of experience in using the information, planning interventions, and implementing actions reflected more trends in improvements over time than did beginner schools. Three to five years is often suggested as the time it takes for educational reform to have an impact. This finding is encouraging.

An extensive literature reports the relative stability of school norms, beliefs, and practices (Sarason, 1971; Deal, 1993) and some causal factors have been identified. For example, Deal (1993) identified three broad categories of factors responsible for the stability of school cultures: (1) individual resistance, (2) formal structure of schools and classrooms, and (3) changes that threaten power relationships, challenge existing coalitions, and generate conflict. The need for additional longitudinal analyses of the resiliency of school cultures and responsible factors is evident.

While school cultures or climates appear to be resistant to change, the PATS collaboration has taken important steps in addressing this phenomena. The project documents that a system of collecting, structuring, and communicating information useful in highlighting and defining problem areas or issues for school leaders can be implemented. The information collected and reported to schools does not identify problems, establish priorities, or design remedies. Clarifying organizational issues and transforming school cultural systems are the responsibilities of school administrators, teachers, students, and parents. State department personnel and university researchers provide information, support, and overall project management. Culture building, and all that it entails, must occur within the contexts of individual schools. PATS has provided a large number of schools with opportunities to engage in this challenging endeavor.

The work reported here acknowledges that Tennessee is a leader among the states in providing practitioners with information and support that has potential to assist and motivate them to change their perspectives and practices. Moreover, the educational information system implemented in PATS demonstrates that measures of what goes on in schools are important sources of information that can be used in discussions by school leaders about their workplaces as organizational entities. The need to explore further the stability and malleability of school cultures is apparent.

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Table 1

Characteristics of the School Sample

Variable		School Level			Total (N = 92)	%
		Elementary (n = 51)	Middle (n = 21)	Senior High (n = 20)		
State Region	East	21	9	8	38	41.3
	Middle	17	7	4	28	30.4
	West	13	5	8	26	28.3
Community	Rural	19	6	7	32	34.8
	Small Town	18	7	6	31	33.7
	Urban	11	6	6	23	25.0
	Suburban	3	2	1	6	6.5
Number of Teachers	Mean	23.8	33.9	42.9	30.3	
	Range	8-55	19-49	10-80	8-80	

Table 2

Unadjusted School Climate T-scores by Program Experience and School Level

School Level	Beginner			Experienced			Total		
	Base	1993	Δ	Base	1993	Δ	Base	1993	Δ
Elementary									
Order	50.4	49.5	-0.9	51.9	55.0	3.1	51.1	52.3	1.2
Leadership	50.5	50.7	0.2	51.0	53.3	2.3	50.8	52.0	1.2
Environment	49.4	50.4	1.0	52.8	53.8	1.0	51.1	52.1	1.0
Involvement	50.2	52.1	1.9	50.4	54.3	3.9	50.3	53.2	2.9
Instruction	51.4	55.0	4.6	50.5	61.3	10.8	51.0	58.2	7.2
Expectations	50.7	51.4	0.7	51.8	56.7	4.9	51.3	53.5	2.6
Collaboration	49.4	51.6	1.2	52.4	55.3	2.9	50.9	53.5	2.6
Middle/Senior High									
Order	53.4	53.0	-0.4	50.6	51.7	1.1	51.6	52.2	0.6
Leadership	52.0	52.8	0.8	51.3	51.0	-0.3	51.6	51.7	0.1
Environment	52.4	53.8	1.4	52.7	55.0	2.3	52.6	54.5	1.9
Involvement	51.2	53.6	2.4	50.9	53.5	2.6	51.0	53.5	2.5
Instruction	53.5	55.2	1.7	51.3	55.3	4.0	52.2	55.3	3.1
Expectations	52.7	53.4	0.7	51.4	52.9	1.5	51.9	53.2	1.3
Collaboration	52.8	55.3	2.5	51.9	54.8	2.9	52.3	55.0	2.7
Total									
Order	51.6	50.9	-0.7	51.3	53.4	2.1	51.4	52.2	0.8
Leadership	51.1	51.5	0.4	51.2	52.2	1.0	51.1	51.8	0.7
Environment	50.6	51.7	1.1	52.8	54.4	1.6	51.8	53.1	1.3
Involvement	50.6	52.7	2.1	50.7	53.9	3.2	50.6	53.4	2.8
Instruction	52.2	55.1	2.9	50.9	58.3	7.4	51.5	56.8	5.3
Expectations	51.5	52.2	0.7	51.6	54.8	3.2	51.6	53.6	2.0
Collaboration	50.7	53.1	2.4	52.2	55.1	2.9	51.5	54.2	2.7

Note. Δ = change. Elementary Beginner, n = 26; Elementary Experienced, n = 25; Middle/Senior High Beginner, n = 17; Middle/Senior High Experienced, n = 24.

Table 3

Discriminant Function Coefficients of Five School Climate Dimensions for the
Prediction of Experience

Dimension	Unstandardized Coefficient	Standardized Coefficient
Order	-.043	-5.14
Leadership	-.118	-13.26
Environment	.055	6.46
Involvement	.115	16.18
Instruction	-.237	-4.01

Note. $N = 92$ schools.